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ABSTRACT

This paper reviews literature on the use of computers at work and home, computer skills needed by new teachers, and suggestions for administrators to support computer usage in schools. A survey of 52 school districts serving the Houston area of southeast Texas is reported, indicating that 22,664 computers were in use, with a mean of 436 computers per district in 1994, up from 86 computers per district in 1985, 202 in 1989, and 323 in 1991. Almost one third of the computers were Apple IIe/IIgs, followed by IBM, IBM clones, Macintosh, Commodore, and other brands. The estimated mean computer literacy rate for teachers in the districts was 48 percent, with a range from 5 percent to 100 percent. The mean number of computer labs in a school district was 11 labs, with a range from 1 to 85. Forty-five of the 52 districts indicated that they had networked computers. A copy of the one-page survey form is appended. (Contains 10 references.) (JDD)

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COMPUTERS IN SCHOOLS OF SOUTHEAST TEXAS IN 1994

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ABSTRACT

The population of this study included 104 school districts in Education Service Center Regions IV and VI. These centers serve twenty-two counties of southeast Texas in the Houston area. Fifty-two questionnaires were returned from 104 school districts for a return rate of 50%.

22,664 computers were reported in use by the 52 districts with a mean of 436 computers per district in 1994; up from 86 computers per district in 1985, 202 computers per district in 1989, and 323 computers per district in 1991. Of the 22,664 total computers, 6974 were (31%) **Apple IIe/IIgs**; 4992 were (22%) **Macintosh**, 46 were (1%) **Commodore**; 4981 were (22%) **IBM clones;** 5452 were (24%) **IBM**; 0 were (0%) **TRS 80**; and 30 were (0%) **other brands.**

The estimated mean computer literacy rate for teachers in the districts was 48% with the range from 5% to 100%. The mean number of computer labs in a school district was 11 labs with the range from 1 to 85. Forty-five of the 52 districts school districts (87%) indicated that they had networked computers; the range was 1-70 labs per school district.

COMPUTERS IN THE SCHOOLS OF SOUTHEAST TEXAS IN 1994

Purpose of the Study

The United States is rapidly becoming a computer-dependent society as computers proliferate and impact every aspect of the nation's life. Development and use of microcomputers (PC's) have spurred increased interest in the use of technology to improve educational quality and access throughout the nation. The number of PC's in U. S. schools is projected and shown (Grayson, 1991) in Figure 1.

insert Figure 1 here

The educational trends in the last 20 years involve television, computers, and multimedia. Television never reached its educational potential. The issue of computer use in the schools is not settled. Multimedia is combining all of the above and providing a new buzz word and instructional tool. During the past ten years, computer use in schools increased at an accelerated pace. One of the major financial issues faced by school districts and educational institutions was the purchase of hardware configurations. During the decade, computers in schools became a complex and controversial topic while placing new demands on educators. If the potential of educational computing goes unrealized, educators again will inevitably be criticized for failing to prepare students for the future. High school graduates in the 1990's are expected to be proficient at processing information and solving problems by utilizing modern equipment--see Figure 2 (QED, Inc. Denver, CO. 1992, p. 12).

insert Figure 2 here

A positive impact of computer technology in education will not be realized until a significant number of educators have personal access to computers.

> "The computer is the greatest 'piano' ever invented, for it is the master carrier of representations of every kind. Now there is a rush to have people, especially schoolchildren, 'take computer.' But if teachers do not nourish the romance of learning and expressing, any external mandate for a new 'literacy' becomes as much a crushing burden as being forced to perform Beethoven's sonatas while having no sense of their beauty. Instant access to the world's information will probably have an effect opposite to what is hoped, students will become numb instead of enlightened." (Kay, 1991, p. 138)

The purpose of this study was to provide educators with the data necessary to make a knowledgeable decision in relation to the purchase of computer hardware for education. Data was gathered concerning brands of computers presently in use, percent of computer literacy among faculty, number of computer labs in the school district, use of networking in labs, and brands of computers by grade level. Similar data was gathered over the past decade in the schools of southeast Texas.

Review of the Literature

The Texas Poll (Silverman, 1993) of 1006 adults in the state found that 52% of those surveyed use a computer at work, 34% use a computer at home. The most common programs were word processing (40%), programs to do work at home (16%), and accounting (15%) the most used programs. At work the most used programs were word processing (19%), data entry (18%), office management (14%). In a similar 1984 Texas Poll, only 14% of the respondents had a computer in their homes and the primary use was to play games on a Commodore 64. In the 1993 Texas Poll, the IBM-compatible computer (65%) was the most popular with Macintosh (13%) second. The Texas Poll was conducted by the Public Policy Research Institute of Texas A & M University.

Despite the increased use of computers in the marketplace, only 28% of employees hired by companies already have the necessary computer skills. As people are exposed to the efficiency of computers in the

workplace, the use of personal computers in the home is inevitable (Forrester, 1993).

Experts estimate that there are 2.5 million computers in the entire public education system; this number averages about one computer for every 18 students. The Dataquest report shows Apple Computer edged out IBM for the second year in a row as the No. 1 seller of PC's Apple had a 14.1% share of the domestic market compared to IBM's 13.9% while Compaq sold more portable computers last year. (Beach, 1993).

A survey (Beichner, 1993, p. 18) of over 1100 preservice teachers in Michigan indicated that 90% agreed or strongly agreed with the statement "I want more experience using computers" and 76% similarly felt that computer use enhances learning. A survey (Hurteau, 1990) of New York state computer-using teachers revealed that only 20% felt they had received sufficient preservice education of training. The study reported that most teachers who use computers in their classrooms were self-taught. In the 1990 survey, New York state teachers were asked to rank computer skills needed by new teachers.

Computer Skills	Ranking
Word Processing	1
Computers in Curriculum	2
Introduction to Computers	3
Subject-area Training	4
Teacher Utilities	5
Database Management	6
Desktop Publishing	7
Graphics	8
Spreadsheets	9
Minor Hardware Maintenance	10
DOS Commands	11
Logo	12
BASIC	13
Pascal	14

> There are millions of computers in schools now, but if you walk into a classroom at random, it's highly unlikely that you will see as student being taught by a computer. The Information Revolution has transformed our world, yet left our schools untouched. "If your great-grandmother came back to visit a classroom today, she would recognize almost everything. "However, very few computers can be classified as educational technology in the usual sense of the term. Unlike movie projectors, VCR's, language labs, and the like, school computers are rarely involved in delivering instruction in traditional subjects. Most school computers are just like typewriters, pianos, and microscopes--technology, certainly; used in equation, yes; but not what one usually thinks of when education technology is mentioned. The key difference is that computers are objects of study--a tool worth mastering through investigation and practice. No one studies movie projectors and VCR's, nor should they. Ask students sitting at a computer what they are doing and the usual responses will be "Learning to use word processing" or "debugging", or working on a spreadsheet". The most important thing a school can do with a computer is to teach students to become literate users of the computer, not just recipients of computerized lessons. (Luehrmann, 1990, pp. 14)

Luehrmann (1990, p. 16) provided "Tips for Administrators" as follows:

1. Do support your computer teachers--the ones who take on responsibility for teaching students to use the computer as a tool. They are taking the risk and need your help.
2. Don't pressure all the other teachers to use computers. They'll be unhappy and they won't accomplish what you want as effectively as the computer teachers will.
3. Do create half-year or year-long courses in computing, where students immerse themselves in the subject.

4. Don't divide the responsibility for teaching about the computer among the whole staff. That is about as effective as asking everyone to teach a little French in their class.
5. Do select computer textbooks that emphasize skills and understanding, not just factual knowledge about computers and society.
6. Don't expect computer teachers to create all their materials from scratch. The job is far too big.
7. Do build a computer lab where an entire class can go and do its computer work.
8. Don't put a computer in every classroom until the lab is equipped. Isolated computers go unused most to the time.
9. Do evaluate your computer education program and make certain that it teachers worthwhile computer skills to a broad range of students.
10. Don't let the computer class become a mostly male club for a handful of computer fanatics.
11. Do give your computer teachers the opportunity for learning more about what they are teaching. This includes university courses and attendance at computer teacher conferences. This includes university courses and attendance at computer teacher conferences.

Thirty-two percent of districts questioned had computers aged five years or older, according to a 1990-91 survey of K-12 public school districts. "I think we're going to see the emphasis change from the Apple II series to the Macintosh. The trend now is heading toward Macintosh it seems, even in grades K-8. The Macintosh LC is starting to come around. The ability to run Apple IIe software on the Mac LC has been innovative. Some schools have 500 programs and they are not going to throw away that software for the IBM. Schools are buying IBM, especially in high school business classes." (Computer Reseller News, 1991, p. 134).

The newest product on the computer market is the Power Personal Computer (Power PC) based on the new CPU chip created by a consortium of Apple, Motorola, and IBM. It runs virtually all Macintosh system based software, most current programs for MS-DOS and Windows by adding

SoftWindows, a DOS emulating program, and is a third of the size and cost of the Intel chip. Reports indicate that it runs 30% to 300% faster than the new Intel Pentium (80586) chip. Intel is advertising heavily with the Pentium chip.

Methods and Procedures

The population of this study included 104 school districts in Education Service Center Regions IV and VI. These centers serve twenty-two counties of southeast Texas in the Houston area. Fifty-two questionnaires were returned from 104 school districts for a return rate of 50 percent.

*** insert Figure 3 here ***

22,664 computers were reported in use by the 52 districts with a mean of 436 computers per district in 1994; up from 86 computers per district in 1985, 202 computers per district in 1989, and 323 computers per district in 1991. Of the 22,664 total computers, 6974 (31%) were **Apple IIe/IIgs**; 4992 (22%) were **Macintosh**, 46 (1%) were **Commodore**; 4981 (22%) were **IBM clones;** 5452 (24%) were **IBM**; 0 (0%) were **TRS 80**; and 30 (0%) were **other brands**.

*** insert Table 1 here ***

The estimated mean computer literacy rate for teachers in the districts was 48% with the range from 10% to 100%. The mean number of computer labs in a school district was 11 labs with the range from 1 to 85. Forty-five of the 52 districts school districts (87%) indicated that they had networked computers. Range was 1-70 labs per school district; the literacy rate was 5%-100%.

Conclusions

From the results of the study, several general conclusions can be made. First, it was apparent that Apple Computers were preferred at all grade levels in the school districts serviced by Education Service Centers Region IV and VI. The bidding arrangement for Apple Computers through Education Service Center Region IV starting in 1981 and the present Apple State Contract make Apple the educational computer of choice. Most computer vendors now offer a similar 40 percent discount from list price. About half of the teachers are computer literate, there are 11 computer labs per district, and 87 percent of the labs are networked.

Recent media attention was focused on the University of Oregon's liability under federal copyright laws for using unlicensed copies of software on 60 computers in its Continuing Education Center. The lawsuit, likely to be settled out of court, could cost Oregon up to $100,000. In light of the possible risks regarding software usage, it is suggested that all schools conduct a self-audit of their personal computers and software to determine whether any illegal copies exist. It is urged you take whatever step necessary to correct violations found as a result of the self-audit. The copyright law says it is permissible to run one copy of a software program on only one computer at a time. It is permissible to make one backup copy for emergencies. Any other copies are illegal.

The status of microcomputers in education changes very rapidly. In addition, the computer market itself changes constantly and unpredictably. Because of the changes, continual research in the field of educational computing is needed.

These questions deserve answering. Is one brand of computer better suited for the required Texas junior high computer literacy course? Is one brand of computer better for higher level programming and computer science courses? What brand of computers need to be used to teach business courses in high school with Word Perfect or MS Word, etc. Do Education Service Centers tip the scale in favor of one particular brand of computer? Is there value in having the same brand of computers throughout the district or is exposure to a variety of brand preferred?

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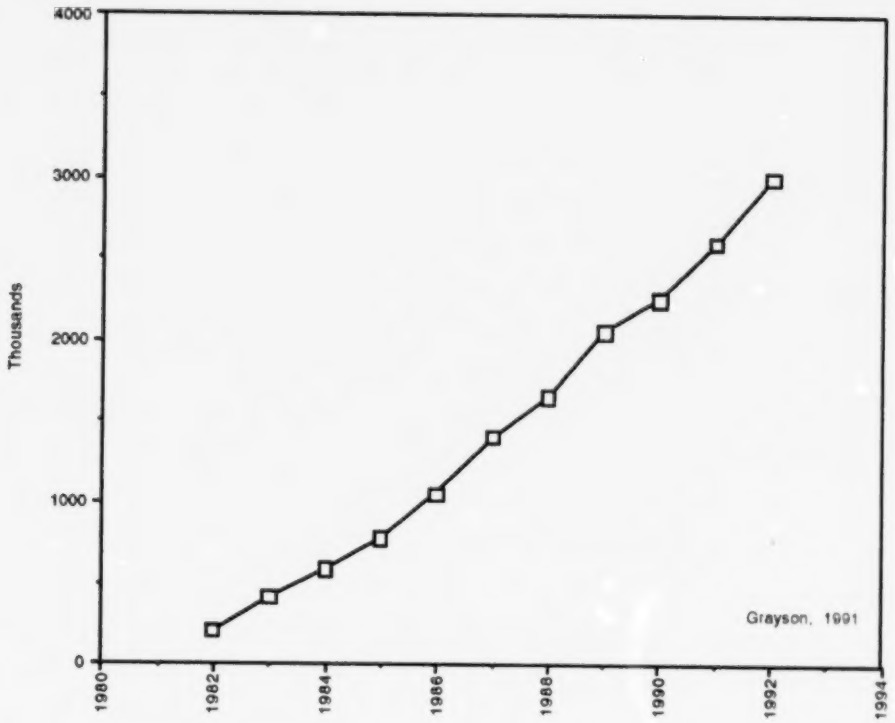

Figure 1

Computers in US Schools

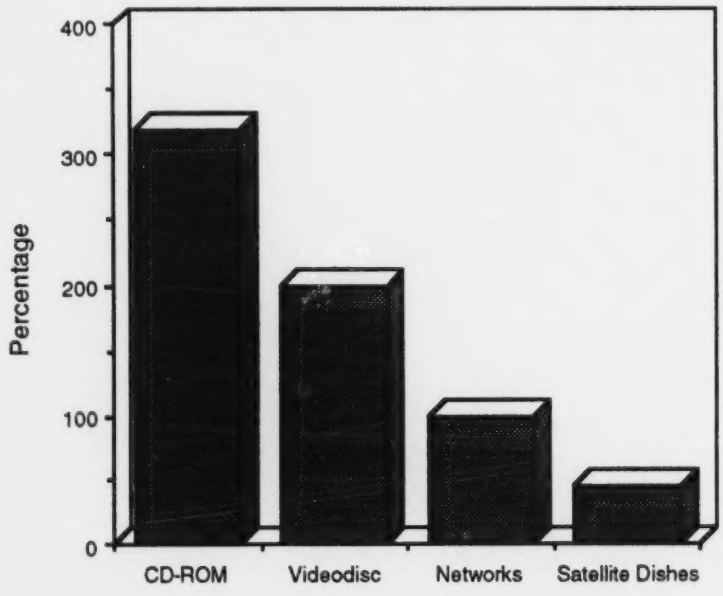

Figure 2

New Technology Growth in Schools 1989-1992

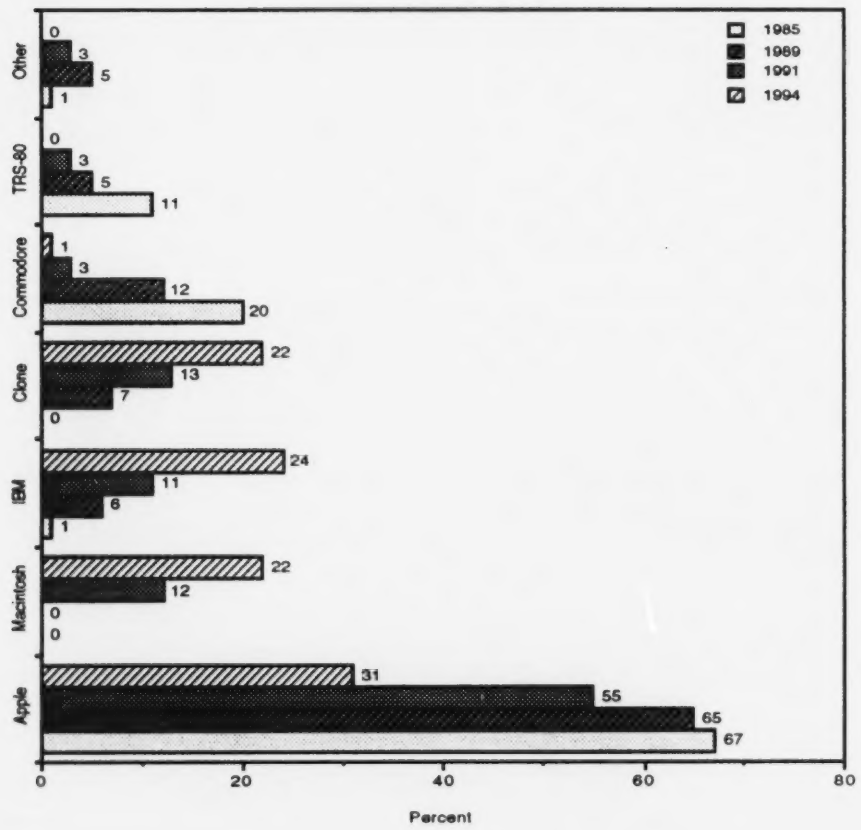

Figure 3

Computer Brands in Schools of Southeast Texas (1985-1994)

Table 1

1994 Survey of Computers in Schools in ESC Regions IV and VI

COMPUTER	ELEMENTARY	JUNIOR HIGH	HIGH SCHOOL	TOTAL	PERCENT
Apple	4043	1742	1189	6974	31%
Macintosh	2231	1417	1344	4992	22%
IBM	2018	810	2624	5452	24%
IBM Clone	1364	844	2773	4981	22%
Commodore	1310	0	36	46	0%
Others	30	0	0	30	0%
TOTALS	9828	4814	8022	22,664	100%

MICROCOMPUTERS IN SCHOOLS

DIRECTIONS: Please indicate what computer brands are at your schools and the total at each level.

ELEMENTARY:

Apple IIe, IIc, IIgs.....How many? _____
Macintosh.....How many? _____
IBM.....How many? _____
IBM Clones.....How many? _____
Commodore.....How many? _____
TRS-80.....How many? _____
Others.....How many? _____
(What Other Brands) _____

JUNIOR HIGH SCHOOL (Intermediate):

Apple IIe, IIc, IIgs.....How many? _____
Macintosh.....How many? _____
IBM.....How many? _____
IBM Clones.....How many? _____
Commodore.....How many? _____
TRS-80.....How many? _____
Others.....How many? _____
(What Other Brands) _____

HIGH SCHOOL:

Apple IIe, IIc, IIgs.....How many? _____
Macintosh.....How many? _____
IBM.....How many? _____
IBM Clones.....How many? _____
Commodore.....How many? _____
TRS-80.....How many? _____
Others.....How many? _____
(What Other Brands) _____

1. Make an estimate of the percent of teachers in your district who know how to use computers (are computer literate)..... _____%

2. How many computer labs are in your district?..... _____

3. Do you have computer labs that are networked?.....Yes No